Ames Laboratory
Baseline Needs Assessment

The purpose of the Baseline Needs Assessment is to ensure that an appropriate level of emergency (fire, medical, and hazardous materials) response capabilities are provided to meet the needs of the Ames Laboratory. This Baseline Needs Assessment (BNA) addresses the requirements of Section 3.b(8) of Chapter II of Department of Energy (DOE) Order 420.1B, Facility Safety. The criterion in Section 4.9 of Guide 420.1, Implementation Guide for DOE Fire Protection and Emergency Services Programs was used to develop this BNA. Order 420.1C, Change 1 (2-27-15), Facility Safety, cancelled DOE Guide 420.1B.

1.0 APPROVAL RECORD

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2.0 REVISION/REVIEW INFORMATION

The revision description for this document is available from and maintained by the author.

3.0 PURPOSE AND SCOPE

DOE Order 420.1C, Facility Safety, requires Ames Laboratory to complete a Baseline Needs Assessment (BNA) or an evaluation in documented form of comparable scope. This assessment is a coordinated effort involving the Ames Laboratory Fire Safety Committee, the Ames Site Office (AMSO), and off-site emergency services organizations. This document shall be provided to the Ames Fire Department and the AMSO. Since Ames Laboratory does not maintain a staffed fire department or fire brigade, the intent of this BNA shall define the necessary capabilities in order to achieve a timely and effective response to fire and related events and to establish a process for periodic review and update.

This BNA proceeds with the basic assumption that there is only one emergency incident (such as a fire) occurring on-site, with a casualty requiring emergency medical assistance. However, this also describes how the fire department would respond if a second incident occurred while the first was underway. The second response capability is based on documented mutual aid agreements and utilization of off-duty personnel.

This BNA is in conformance with applicable NFPA codes and standards as well as supplementary requirements and guidance developed by DOE. It includes organizational responsibilities, collateral duties, facility hazards, response time requirements, personnel levels, required apparatus and equipment.

Ames Laboratory relies upon off-site responders for other-than-minor fire and security incidents, hazardous material accidents, and emergency medical services. Ames Laboratory maintains memorandums of understanding with the Ames Fire Department, Iowa State University's Department of Public Safety, and Mary Greeley Medical Center to provide emergency response services as needed, while Iowa State University (ISU) maintains mutual aid agreements with the City of Ames Police Department, Story County Emergency Management Agency, and the Iowa Emergency Management Agency.

4.0 CONFORMANCE AND REQUIREMENTS

4.1. Organizational Responsibilities

Fire protection responsibilities fall under the authority of the Ames Laboratory Fire Safety Committee (FSC), a sub-committee of the Safety Review Committee (SRC). The FSC reports to the SRC, which reports to the Ames Laboratory Director. FSC membership is assigned to four members: three voting members and one attending member who will vote as needed in the absence of a voting member. The Chair acts as the liaison with the SRC.

In the event of a fire or a hazardous materials (HAZMAT) response, the Ames Fire Department (AFD) would assume lead as Incident Command.

Mary Greeley Medical Center is the medical provider in the event of casualty, though the AFD can provide basic life support (non-transport) until the arrival of a Mary Greeley Medical Center ambulance.

4.2. Facility Hazards

Ames Laboratory is a government-owned, contractor-operated national laboratory of the United States Department of Energy's Office of Science. Iowa State University (ISU) is the contractor. The Laboratory is physically located on the University's campus. Ames Laboratory is a basic energy science laboratory conducting mainly bench top scale activities.

Ames Laboratory operates in government-owned buildings that are located on approximately 10 acres of University land leased to the federal government on a long-term basis. The Laboratory occupies approximately 325,000 gross square feet in government-owned buildings. Over 70% of this space is contained in 4 major research-use buildings. Three were built between 1949 and 1960 and the fourth built in 2015. The newest building is located at the Applied Science Complex, 1900 Scholl Road (~1.8 miles from main buildings). An office- use building (less than 15% of total square footage) was built in 1994, which consolidated most administrative and support functions in one location for improved efficiency, allowing space in other buildings to be repurposed for research activities. The balance of the space is contained in several small auxiliary buildings constructed primarily during the 1960s. These buildings provide space for support functions such as storage, records handling and storage, material receiving areas, warehouse functions and shop facilities. The Laboratory is integrated into the ISU campus in such a way that ISU provides and

maintains the site-wide infrastructure (e.g. heating plant, chilling plant, roads, etc.). In addition to space in the federally-owned buildings, the Laboratory also utilizes space in University-owned buildings adjacent to the main site for research activities. ISU is responsible for maintaining non-Ames Laboratory buildings. The AFD responds to ISU buildings and Ames Lab buildings in the same manner. ISU does not have a dedicated fire department.

4.3. Response Time

The AFD can typically respond to Ames Laboratory in less than five minutes. In the event of a hazardous materials response beyond the capability of the City of Ames, the Des Moines HAZMAT Group can respond in approximately 40 minutes (via an established mutual aid agreement). The AFD also has mutual aid agreements with the surrounding communities.

Based on the physical locations of the fire stations, the activity risk, the type of building construction (Type I construction, defined by NFPA 220), the majority of the Ames Laboratory buildings having early detection (smoke and heat detectors) and automatic fire suppression (sprinklers), and the use of a supervised alarm system, the response time of approximately five minutes is acceptable.

4.4. Personnel Levels

The AFD is a professional fire department employing 55 uniformed personnel (one Chief Officer, two Deputy Chiefs, three Captains, nine Lieutenants) and one Administrative Assistant spread over three stations.

Station One - Headquarters	*Station Two*	*Station Three*
1300 Burnett Ave	132 Welch Avenue	2400 S. Duff Avenue
Ames, Iowa 50010	Ames, Iowa 50014	Ames, Iowa 50010
~1.39 Miles northeast	~0.57 miles south	~4.8 miles southeast

The services provided include:

- Fire
- Suppression
- Education
- EMS (basic life support non-transport)
- Hazmat
- Vehicle extrication
- Trench rescue
- Confined space rescue (limited)
- High angle/ low angle rope rescue

DOE Order 420.1C references NFPA 1500, Standard on the Fire Department Occupational Safety and Health. In this standard, the minimum number of trained firefighters necessary to begin interior structural fire-fighting should be five. The AFD maintains a minimum of 12 trained firefighters.

The City of Ames Fire Department personnel levels are adequate to achieve a timely and effective response in the event of fire or other related event.

4.5. Available Apparatus and Equipment

- 4 engines (pumpers)
- 1 ladder truck
- 2 medium rescue trucks
- 1 hazmat truck
- 1 rescue (EMS) vehicle
- 1 command vehicle
- 3 administrative vehicles
- 1 rescue boat

Minimal repairs and maintenance are completed in house. Repairs above the competence of the in-house personnel are performed by the distributor. Leased vehicles are used when trucks are out for major service.

The City of Ames Fire Department is adequately equipped to achieve a timely and effective response in the event of a fire or another related event.

4.6. Training, Physical Fitness, and Medical Programs

Ames Laboratory does not maintain a staffed fire department or fire brigade. That service is provided by the City of Ames Fire Department. All of their uniformed personnel are trained to either Fire Fighter 1 or Fire Fighter 2 Level. Their First Responders are trained to Responder D Level (Basic Life Support – BLS). The majority of the staff are also trained as Hazmat Technicians.

The AFD annually performs a physical exercise (drill) on the campus of ISU (occasionally at Ames Laboratory).

Member(s) of the AFD are invited to participate in physical and table top exercises performed by the Laboratory's Emergency Preparedness Committee, contributing to the awareness of off-site staff to local events. This invitation is commonly attended by at least one member (typically a Captain) of the AFD.

Ames Laboratory invites the AFD to tour the facility annually, to allow new officers to gain a pre-incident view of the facility, and to familiarize experienced officers with the site and building(s).

The City of Ames Fire Department is adequately trained to achieve a timely and effective response in the event of fire or other related event.

4.7. Pre-fire Plans

The AFD has pre-fire plans for all Ames Laboratory buildings. The pre-fire plans include emergency shut- offs, emergency points of contact, building plans, listing of unique hazards, fire hose connections, locations of post indicator valves (PIVs), etc. To aid in the development of fire plans, Ames Laboratory provides PDFs of floor plans.

4.8. Hot Work Permits

Hot work permits are described in Section 8 of the Ames Laboratory Environment, Safety, Health, and Assurance (ESH&A) Program Manual. Permitting is performed by ESH&A and Facilities and Engineering Services (FES), with the majority of hot work being performed by FES in the completion of repair and remodeling efforts. Permits are approved by permit authorizing individuals in FES and ESH&A who have been trained

in hazard recognition and are familiar with the typical hazards and procedures involved. Permits are presented to Plant Protection Section (PPS) personnel, who can bypass the appropriate fire annunciation for the building involved with the permit. The individual requesting the bypass must remain in the building and in radio contact until the bypass is cancelled. This practice is in place to prevent false fire evacuations by occupants. Alarm bypass procedures are maintained in PPS.

4.9. Unwanted and Waste Chemicals

Unwanted chemicals are collected by generator request and transferred to B55 Spedding Hall, where organic solvents are bulked into 55-gallon drums and stored in rated flammable liquid storage cabinets. All unwanted chemicals are removed by a chemical waste contractor every 180 days. B55 Spedding is equipped with smoke detection and fire suppression systems. The door is locked at all hours with the door monitored after hours.

4.10. Fire Inspections

Fire inspections of the site are conducted daily by the PPS officers during their tours of the facility, annually during program/department and independent walk-throughs, and every five years during the Readiness Review process for activities. Each process has documented provisions for remedial actions to correct conditions that might increase fire risk.

4.11. System Impairments

Procedures for sprinkler system impairments reside in the PPS and address the need for posted signage and notification of interested parties (including AFD), both prior to the impairment and after return-to-service.

4.12. Central Station Monitoring

The PPS is a six-person, uniformed, unarmed force divided into three shifts of two people each. Shifts are based on straight eight work hours, with the on-coming officer(s) relieving the off-going officer(s) to maintain continuity. On-shift assignments are staggered to allow alternate weekends off, with two-officer days typically occurring on week days. Primary responsibilities include attending to the central station to observe and respond to fire and security alarms and touring the facility to observe and report conditions. Additional responsibilities involve reacting to alarms or observations as the site's temporary Emergency Coordinator until appointed personnel can respond to the scene.

All valves for the sprinkler systems are electronically monitored via the Simplex central station by PPS or, as is the case of the post indicator valves, are padlocked and inspected weekly by PPS.

4.13. Radio Communication

Ames Laboratory is provided with on-site VHF stations and two (2) radios that the ISU Department of Public Safety utilizes in the event of the need to communicate directly.

4.14. Insurance Rating Organization (ISO)

The City of Ames Fire Department maintains an ISO Rating of 3 (from a 1 to 10 scale with 1 being the highest rating).